to believe that the creation of a new university with full powers in the metropolis is ever likely to come within the bounds of political possibility. It is not that the Government will be inaccessible, but that it will be difficult to persuade general public opinion of the necessity of such a course. We believe that it will in the end be necessary eventually to come to terms with the existing university. The fact that eleven members of its Senate have joined the movement, shows that that body at any rate contains a powerful element discontented with its present asphyxiation by red tape. What, however, we do hope to see is the federation of our scattered educational bodies in London into Faculties, which would be practically universities in all but the name, and the representatives of which should have a leading voice in the management of the Central University. The only speakers who really evinced at the meeting a clear idea of their own policy, were the representatives of the Medical profession. Prof. Marshall showed with singular lucidity that the altered character of medical education has made the continued isolation of the smaller medical schools a practical impossibility. Not merely has technical instruction gone beyond the capacity of the junior members of the medical staff who are usually told off for it, but the appliances required are too costly for all but the wealthier schools to provide efficiently, and the teachers are themselves wanted for the more minute and careful clinical instruction which is now everywhere demanded.

The Medical Schools will therefore combine, perhaps, into some four great groups, for purposes of education and the organisation of laboratories, just as the small colleges at Oxford and Cambridge have combined for purposes of intra-collegiate lecturing. Once federation has begun, the foundation of a medical faculty for London is only a question of time. This will come about, probably, whatever the fate of the more general movement. But such a faculty would undoubtedly be found to be politically a body to whose just claims in direct medical education the University of London would find it impossible to lend a deaf ear.

The faculty of law may also shape itself into existence, though, it must be admitted, the elements of its form are, at present, very dim and shadowy.

To balance these we want a faculty of literature and science, and the materials for these are to be found in a federation of University and King's Colleges, as suggested by Prof. Lankester. If the representatives of such a faculty were allowed a proper share in the councils of the existing University, it is not obvious why such a federation should be intrusted with a separate degree-giving power.

We now come to what appears to us the weak point in the scheme. A university may impart knowledge; it may test its quality when imparted; but that which has ever been the peculiar glory of university life, is to enlarge its bounds. But except a few well-expressed sentences which fell from Lord Reay, and a sentence put into the conclusion of the report very much with the air of an afterthought, this very important matter does not seem to have received very much attention. Now the most melancholy feature about such elements of university organisation as already exist in London, is its displayed incapacity to retain its best men. There is an obvious dearth of such posts as would satisfy their legitimate ambition. No sooner amongst us does a man rise to the first rank at any seat of education, than sooner or later he is drafted off to one of the universities in the provinces. To take the first instances that come to hand: Cambridge has robbed us of Michael Foster, and Oxford of Burdon Sanderson, while the greatest biological teacher of the day is driven from England by ill-health after a life toilsomely spent in the lowest order of teaching—drudgery. What is absolutely essential to add lustre and distinction to the work of a Metropolitan University is a body of University Professors who would take charge of the higher studies, which never can be properly cared for by bodies sedulously occupied with the very serious business of the higher education. What we hope then some day to see is the University of London equipped with a proper staff of Regius Professors, who themselves would be at the least an invaluable bond of union between its own too abstract isolation and the living reality of the actual teaching bodies.

Although we could have wished for greater insistence on this—as it seems to us—most vital point, we cannot but entertain the highest hopes of the usefulness of the present movement. It has some of the notes of healthy organic development; it has at least spontaneity and individual activity, which have always been the foundations of political achievement amongst us. At the worst, mere effervescence is better than stagnation, and we think there is more in this movement than effervescence. In any case we cannot too warmly tender our expression of acknowledgment to public men like Lord Reay and Sir George Young, who have spared neither pains nor labour in the purely patriotic labour of giving our own too inarticulate murmurings definite form and expression.

THE POLYZOA OF THE "CHALLENGER" EXPEDITION

The Zoology of the Voyage of H.M.S. "Challenger." Part XXX. "Report on the Polyzoa—the Cheilostomata." By George Busk, F.R.S., V.P.L.S., &c. (Published by Order of Her Majesty's Government, 1884.)

THE description of the Polyzoa collected during the expedition of the *Challenger* was undertaken by Mr. Busk, and the first part of his Report, comprising the Cheilostomatous forms, or those in which the mouth of the zoœcium or cell is provided with a movable lid which shuts down over the polypide when retracted, has just been published.

The investigation of this important part of the *Challenger* collections could not have been placed in better hands. As an authority on the zoology of the Polyzoa, Mr. Busk stands pre-eminent; and the present admirable Report of 216 pages and 36 plates bears testimony to a laborious and conscientious investigation, the value of which as a contribution to our knowledge of the multitude of forms associated under the name of Polyzoa cannot be over-estimated.

The number of species of Cheilostomatous Polyzoa in the *Challenger* collection is 286, and when these came into Mr. Busk's hands he found no less than 180 of them

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new. In one genus alone, that of the *Reteporæ*, the number of known species has been raised by the dredgings of the *Challenger* from 31 to between 50 and 60.

The determination and definition of species in a collection so large as that of the *Challenger* Polyzoa, and in a group of organisms in which the differences are far from being always strikingly obvious, cannot but be a work of great labour. The critical examination of the species in such a genus as *Retepora*, for instance, which is represented in the *Challenger* collection by 23 species, and *Cellepora*, which is represented by no fewer than 31, requires no ordinary patience, and the author must be congratulated on having so far brought to a conclusion labours which, in order to be conscientiously performed, must be often wearisome and monotonous.

Among the most important contributions of the Report to the systematic zoology of the Polyzoa is the revision which it contains of *Adeona* and allied genera. A critical comparison of the species of *Adeona* with species belonging to other genera which had been hitherto placed among the *Escharidæ* has necessitated the founding of a new family, *Adeoneæ*, in order to include the whole in a single natural group. This family has several peculiarities, among which the most interesting is the possession by all the species of three different kinds of cells, which the author terms zoœcial, oœcial, and avicularian. Oœcia of the ordinary type are entirely absent, and their function appears to be performed by special cells which differ in form from the others. When decalcified these oœcial cells appear as thick-walled sacs, containing in most cases an ovoid mass, which resembles the contents of an ordinary oœcium, and like these is almost certainly embryonal. Mr. Busk has further made the important observation that in some of them there is lodged instead of this mass a polypide similar to those inhabiting the zoœcial cells, and he concludes that the embryonal mass is derived from a polypide, which it finally replaces.

Among other peculiarities of the Adeoneæ is one which, notwithstanding its apparent triviality, derives importance from its constancy. This consists in the universal presence of a projecting point at each end of the base in the avicularian mandibles both large and small. In doubtful fragments this character alone will often indicate the affinities of the species.

The descriptions of the new species are throughout the work drawn up with that care and precision which characterise all Mr. Busk's zoological writings, while the absence of redundant description and the exclusion of characters not necessary for the diagnosis, give to his definitions a conciseness which will be appreciated as it deserves by all who require to consult the Report.

In a large proportion of the diagnoses the author has had recourse to the chitinous elements of the skeleton. These are the so-termed opercula or oral valves, and the chitinous parts of the avicularia and vibracula; and a very large number of accurately-executed outlines are given in order to show the various forms assumed by these elements in the different species. The employment of the chitinous elements in the classification and descriptive zoology of the Polyzoa is due entirely to Mr. Busk, who has convinced himself that "their value for these purposes cannot be over-rated, while their importance extends far beyond the mere distinction of genera and species."

The descriptions of the species are of course necessarily confined to the hard parts, whether calcareous or chitinous, for, except in living examples, it is rarely possible to determine any facts of importance regarding the soft parts of the colony. The author, however, gives two highly instructive figures of the avicularia of *Bicellaria pectogemma*, in which the muscular apparatus and other soft parts of these curious and still enigmatical bodies are clearly and beautifully represented. In one of his figures of *Carbasea moseleyi* also—a form in which the calcareous walls are quite transparent—there is a very interesting view of the polypides in the interior of their cells.

The distribution of the species, geographical and bathymetrical, finds a prominent place in the Report. An instructive map is appended in which the oceans traversed by the *Challenger* are divided into seven regions, three being to the north and four to the south of the equator, each including 90° of longitude. In each of these regions the stations from which any species of Polyzoa were obtained are indicated.

The bathymetrical range varies within wide limits. The greatest depth which yielded any species to the dredge was 3125 fathoms, in the North Pacific region. From this vast depth four species were procured, and between it and quite shallow water a great number of stations of very various depths are recorded.

One of the most unexpected facts brought out in the Report is the very wide bathymetrical range enjoyed by certain species. Thus *Cribrilina monoceras* is one of the four species brought up from 3125 fathoms in the North Pacific, while the same species was obtained from 1325 fathoms in the South Pacific, from 69 fathoms in the South Indian or Kerguelen region, from 55 fathoms in the South Atlantic, and from 35 fathoms in the Australian region.

This striking difference in the depths inhabited by one and the same species is, however, exceptional; and so is the wide range of geographical distribution which is here presented by a species occurring at great depths. The study of the bathymetrical distribution of the *Challenger* Polyzoa shows that "the extent of geographical distribution is to a considerable degree correlative with the bathymetrical, the wider geographical distribution being in most instances coincident with the shallower depths."

To this law another striking exception is afforded by the beautiful genus *Catenicella*, a genus very rich in species, which, though from comparatively shallow water, are almost exclusively confined to the Australian region.

The thirty-six beautiful plates which illustrate the Report are all that could be desired. Clearly and faithfully drawn, they place in the hands of the zoologist facilities for the determination of the species which, with the descriptions in the letterpress, leave no excuse for erroneous diagnosis.

Though the Report is confined to the species obtained during the expedition of the *Challenger*, the number of these is so large, and the descriptions and figures so exact, that the work will possess a classical value, and be found indispensable by every student of the Polyzoa.

G. J. A.

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